EVALUATION AND MAPPING OF CONCRETE AND REBAR CONDITION WITH THE GPR METHOD OF AN OLD BUILDING FACING DAILY EXTREME STRAIN

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We employed Ground Penetrating Radar (GPR) technique in order to assess firstly and then to map the concrete condition and the rebar of an old building, used as a coach house by an important cars importer in Greece. The owners wanted to build a new section on the top of the existing building in order to store hundreds of cars and trucks. The building was erected by the mid of 1970's and has responded quite well to the big earthquakes of 1981 and of 1999.

We used a GSSI Ground Penetrating Radar, which gives data of high quality and precision and processed this using the Radan 6 post-processing software. The antenna of the GPR had a frequency of 1600 MHz, assuring a depth penetration of 20 – 50 cm depending on the material. With this high-resolution antenna, we could locate even small targets in real-time. Only single sided access is required to perform GPR surveys, and thousands of square meters can be inspected in one day. This method is also extremely safe and does not require evacuating areas as with radiography (X-ray) while X-ray can not find non-metallic utilities buried within concrete like GPR technology can, and measuring depth of targets with X-ray can be difficult. We employed 30 GPR sections all over the building, focusing mainly on the most important parts, like pillars, flat roof surface and joints.

The final results showed accordance with the samples that have been taken and indicated with accuracy the points that need restoration.

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